

**COPY**

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
12 May 2005 (12.05.2005)

PCT

(10) International Publication Number  
**WO 2005/042770 A3**

(51) International Patent Classification<sup>7</sup>: **G01N 33/569**, C12Q 1/04, 1/37

(21) International Application Number:  
PCT/US2004/036600

(22) International Filing Date:  
3 November 2004 (03.11.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/516,692 3 November 2003 (03.11.2003) US  
60/578,811 9 June 2004 (09.06.2004) US

(71) Applicants (for all designated States except US):  
ETHICON, INC. [US/US]; Route 22 West, Somerville, NJ 08876 (US). EXPRESSIVE CONSTRUCTS, INC. [US/US]; 6 Park Avenue, Worcester, MA 01605 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): SEBASTIAN, Shite [IN/US]; 37 Harley Drive, Apt. 10, Worcester, MA 01606 (US). COLPAS, Gerard, J. [US/US]; 310 Wachusett Street, Holden, MA 01520 (US). ELLIS-BUSBY, Diane, L. [US/US]; 875 Brockelman Road, Lancaster, MA 01532-2317 (US). HAVARD, Jennifer, M. [US/US]; 9 Eaton Road, Framingham, MA 01701 (US). SANDERS, Mitchell, C. [US/US]; 20 Stillwater Heights Drive, West Bolyston, MA 01583 (US).

(74) Agents: HOGLE, Doreen, M. et al.; Hamilton, Brook, Smith & Reynolds, P.C., P.O. Box 9133, 530 Virginia Road, Concord, MA 01742-9133 (US).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:  
7 July 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

**WO 2005/042770 A3**

(54) Title: METHODS, PEPTIDES AND BIOSENSORS USEFUL FOR DETECTING A BROAD SPECTRUM OF BACTERIA

(57) Abstract: Described herein are methods of detecting a wound infection and for detecting the presence or absence of bacteria, for example, wound bacteria in a sample, by contacting a sample with a peptide substrate derived from the modification of the reactive site loop (RSL) domain of the  $\alpha$  1- proteinase inhibitor. In the current invention, we have demonstrated that these peptide substrates without the alpha 1 protein can be efficiently used as peptide substrates. The modification or the absence of modification of this peptide substrate by the enzyme produced and/or secreted by the bacteria, can serve as an indicator for the presence or absence of the bacteria in the sample. The present invention also features a biosensor for detecting the presence or absence of bacteria in a sample.

Available Copy

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G01N33/569 C12Q1/04 C12Q1/37

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, PAJ, EMBASE, CHEM ABS Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>WO 03/063693 A (EXPRESSIVE CONSTRUCTS, INC; SANDERS, MITCHELL, C; LOWE, ADRIAN, M; HAM) 7 August 2003 (2003-08-07)  cited in the application  abstract  claims 1-67  page 2, line 19 - page 4, line 20  page 8, line 27 - page 10, line 3  page 11, line 7 - line 15  page 15, line 5 - line 18  example 13</p> <p>-----</p> <p>-/-</p>	1-21

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

\* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

\*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

\*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

\*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

\*&\* document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

5 April 2005

02/05/2005

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Vanhalst, K

Best  
Available  
Copy

## INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US2004/036600

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	NELSON DANIEL ET AL: "Inactivation of alpha1-proteinase inhibitor as a broad screen for detecting proteolytic activities in unknown samples", ANALYTICAL BIOCHEMISTRY, vol. 260, no. 2, 1 July 1998 (1998-07-01), pages 230-236, XP002154473 ISSN: 0003-2697 the whole document	1-21
X	SUTER S ET AL: "PROTEOLYTIC INACTIVATION OF ALPHA-1 PROTEINASE INHIBITOR IN INFECTED BRONCHIAL SECRETIONS FROM PATIENTS WITH CYSTIC FIBROSIS", EUROPEAN RESPIRATORY JOURNAL, vol. 4, no. 1, 1991, pages 40-49, XP008045272 ISSN: 0903-1936 abstract	22
X	PETERSON FRANCIS C ET AL: "Insight into the mechanism of serpin-proteinase inhibition from 2D (1H-15N) NMR studies of the 69 kDa alpha1-proteinase inhibitor Pittsburgh-trypsin covalent complex", BIOCHEMISTRY, vol. 40, no. 21, 29 May 2001 (2001-05-29), pages 6284-6292, XP002323305 ISSN: 0006-2960 abstract	22
A	WO 00/63394 A (THE UNIVERSITY OF GEORGIA RESEARCH FOUNDATION, INC; TRAVIS, JAMES; POT) 26 October 2000 (2000-10-26) abstract	22

Best Available Copy

## Information on patent family members

International Application No  
PCT/US2004/036600

Patent document cited in search report	Publication date	Patent family member(s)		Publication date
WO 03063693	A 07-08-2003	CA WO	2474458 A1 03063693 A2	07-08-2003 07-08-2003
WO 0063394	A 26-10-2000	AU WO US	4648700 A 0063394 A2 6833262 B1	02-11-2000 26-10-2000 21-12-2004

Best Available Copy